

REPORT ON MACHINERY.

No. 8892

Received at London Office THU APR 5 1923

Date of writing Report Mar 15 1923 When handed in at Local Office Mar 27 1923 Port of Belfast
No. in Survey held at Belfast Date, First Survey 1919 April 12 Last Survey March 22, 1923
Reg. Book. Steel Y. S. S. Oroya (Number of Visits 151)
Master Belfast Built at Belfast By whom built Harland & Wolff Ltd (No. 506) Tons Gross 1225 Net 438.0
Engines made at Belfast By whom made Harland & Wolff Ltd No. 506 when made 1923
Boilers made at Belfast By whom made Harland & Wolff Ltd No. 506 when made 1923
NOMINAL Registered Horse Power 1323 Owners Pacific Steam Navigation Co. Port belonging to Liverpool
Shaft Horse Power at Full Power 6200 Is Refrigerating Machinery fitted for cargo purposes no Is Electric Light fitted yes

TURBINE ENGINES, &c.—Description of Engines Twin Screw Single Reduction Geared Turbines 4 (2 HP 2 LP)
Diameter of Rotor Shaft Journals, H.P. 6 3/4" L.P. 10 1/2" Diameter of Pinion Shaft 5 3/4"
Diameter of Journals 5 3/4" Distance between Centres of Bearings 43.25" Diameter of Pitch Circle 1.07" + 8.998"
Diameter of Wheel Shaft 14" Distance between Centres of Bearings 3-1 1/4" Diameter of Pitch Circle of Wheel 10'-10.9"
Width of Face 36" Diameter of Thrust Shaft under Collars 14 1/2" Diameter of Tunnel Shaft as per rule 12.94" as fitted 13 3/4"
No. of Screw Shafts Two Diameter of same as per rule 14-36 as fitted 14-23 Diameter of Propellers 14'-0" Pitch of Propeller 15'-0"
No. of Blades 3 State whether Moveable moveable Total Surface each propeller 90 sq ft Diameter of Rotor Drum, H.P. 1850 L.P. 1450 (Curlic) Dies Eastern Dies
Thickness at Bottom of Groove, H.P. solid L.P. solid Astern solid Revs. per Minute at Full Power, Turbine HP 1850 Propeller 100

PARTICULARS OF BLADING.

	H.P.			L.P.			ASTERN.		
	HEIGHT OF BLADES.	DIAMETER AT TIP.	NO. OF ROWS.	HEIGHT OF BLADES.	DIAMETER AT TIP.	NO. OF ROWS.	HEIGHT OF BLADES.	DIAMETER AT TIP.	NO. OF ROWS.
1ST EXPANSION	3 1/4" 1 1/4"	2 1/4" 2 1/4"	2	2 1/4"	5'-11 1/4"	1	3 1/4" 2 1/4"	5'-11 1/4" 5'-5 1/2"	3
2ND	1 1/4" 1 1/4"	2 1/4" 2 1/4"	2	2 1/4"	5'-10 3/4"	1	1 1/4" 2 1/4" 3 1/4"	5'-4 1/2" 5'-5 1/2" 5'-6 1/2"	3
3RD	1 1/4"	2 1/4"	1	2 1/4"	5'-10 3/4"	1			
4TH	1 1/4"	2 1/4"	1	2 1/4"	5'-10 3/4"	1			
5TH	1 1/4"	2 1/4"	1	2 1/4"	5'-10 3/4"	1			
6TH	1 1/4"	2 1/4"	1	2 1/4"	5'-10 3/4"	1			
7TH	1 1/4"	2 1/4"	1	2 1/4"	5'-11 1/4"	1			
8TH	1 1/4"	2 1/4"	1	2 1/4"	5'-11 1/4"	1			
No. and size of Feed pumps	2 1/4"	2 1/4"	1	2 1/4"	5'-11 1/4"	1	Independent feed } see list attached. Bilge pumps }		
No. and size of Bilge pumps	2 1/4"	2 1/4"	1	2 1/4"	5'-11 1/4"	1			

No. and size of Bilge suction in Engine Room 3 @ 3 1/2" ER, 2 @ 3 1/2" BR, 2 @ 6" special, 1 @ 4 1/2" BR + 3 @ 3 1/2" ER. Emergency.
1 @ 2 1/2" bilge suction, Tunnel 2 @ 3 1/2" 1 @ 3 1/2" Emergency 2 @ 3 1/2" in Holds, &c. No. 1 2 @ 3 1/2", No. 2 2 @ 3 1/2", No. 3 2 @ 3 1/2" also 2 @ 2 1/2", No. 4 2 @ 3 1/2"
1 @ 5 1/2" 1 @ 2 1/2" Emergency. 1 @ 3 1/2" in No. 1 2 + 3 holds 2 @ 3 1/2" in No. 4 6 holds, 1 @ 3 1/2" 1 @ 2 1/2" in No. 5 holds
No. of Bilge Injections 2 sizes 1 1/2" Connected to condenser, or to circulating pump yes Is a separate Donkey Suction fitted in Engine Room & size 2 @ 6"
Are all the bilge suction pipes fitted with roses yes Are the roses in Engine room always accessible yes
Are all connections with the sea direct on the skin of the ship yes Are they Valves or Cocks both
Are they fixed sufficiently high on the ship's side to be seen without lifting the stokehold plates yes Are the Discharge Pipes above or below the deep water line below
Are they each fitted with a Discharge Valve always accessible on the plating of the vessel yes Are the Blow Off Cocks fitted with a spigot and brass covering plate yes
What pipes are carried through the bunkers none How are they protected yes
Are all Pipes, Cocks, Valves, and Pumps in connection with the machinery and all boiler mountings accessible at all times yes
Are the Bilge Suction Pipes, Cocks, and Valves arranged so as to prevent any communication between the sea and the bilges yes
Is the Screw Shaft Tunnel watertight yes Is it fitted with a watertight door yes worked from Engine Room deck + Bridge

BOILERS, &c.—(Letter for record 5 Manufacturers of Steel D. Colville & Sons 40B.
Total Heating Surface of Boilers 21480 Is Forced Draft fitted no No. and Description of Boilers Four (4) double ended
Working Pressure 215 lbs Tested by hydraulic pressure to 420 lbs Date of test 15-12-20 No. of Certificate 449
Can each boiler be worked separately yes Area of fire grate in each boiler 129.25 sq ft No. and Description of Safety Valves to each boiler 4 Spring loaded Area of each valve 11.0 in Pressure to which they are adjusted 220 lbs Are they fitted with easing gear yes
Smallest distance between boilers or uptakes and bunkers or woodwork 20" Mean dia. of boilers 15'-9" Length 20'-0" Material of shell plates Steel
Thickness 1 1/2" Range of tensile strength 29 to 33 tons Are the shell plates welded or flanged no Descrip. of riveting: cir. seams Lap Rivet Lap of plates or width of butt straps 2 1/2"
long. seams T.R.D.B. Diameter of rivet holes in long. seams 1 1/8" Pitch of rivets 10"
Per centages of strength of longitudinal joint 99.6 Working pressure of shell by rules 226 lbs Size of manhole in shell 16 x 12
Size of compensating ring 2'-8" x 3'-0" No. and Description of Furnaces in each Boiler 6 corr Material Steel Outside diameter 4'-1 1/4"
Length of plain part top Thickness of plates crown Description of longitudinal joint weld No. of strengthening rings bottom
Working pressure of furnace by the rules 241 lbs Combustion chamber plates: Material Steel Thickness: Sides 3/8" Back 3/8" Top 3/8" Bottom 1" + 1 1/4"
Pitch of stays to ditto: Sides 8 1/2" x 1 1/4" Back 9 1/4" x 1 1/4" If stays are fitted with nuts or riveted heads Nuts Working pressure by rules 224 lbs
Material of stays Steel Diameter at smallest part 2 1/4" x 1 1/4" Area supported by each stay 65.875 Working pressure by rules 238 lbs End plates in steam space
Material Steel Thickness 1 1/2" Pitch of stays 18 1/2" x 1 1/4" How are stays secured AN Wash Working pressure by rules 224 lbs Material of stays Steel
Diameter at smallest part 2 1/4" x 1 1/4" Area supported by each stay 291.4 sq in Working pressure by rules 241 lbs Material of Front plates at bottom Steel
Thickness 1 1/2" Material of Lower back plate Steel Thickness 1 1/2" Greatest pitch of stays 1 1/2" Working pressure of plate by rules 224 lbs
Diameter of tubes 2 1/4" Pitch of tubes 4" x 4" Material of tube plates Steel Thickness: Front 3/8" Back 3/8" Mean pitch of stays 8" x 8"
Pitch across wide water spaces 14" Working pressures by rules 321 lbs Girders to Chamber tops: Material Steel Depth and thickness of girder at centre 2 @ 8 1/2" x 7 1/2" Length as per rule 4'-4 1/2" Distance apart 9" Number and pitch of stays in each 6 @ 1 1/4"
Working pressure by rules 269 lbs Steam dome: description of joint to shell none % of strength of joint yes Diameter yes
Thickness of shell plates Material Description of longitudinal joint yes Diameter of rivet holes yes Pitch of rivets yes
Working pressure of shell by rules yes Crown plates: Thickness yes How stayed yes

SUPERHEATER. Type none Date of Approval of Plan ✓ Tested by Hydraulic Pressure to ✓
Date of Test ✓ Is a Safety Valve fitted to each Section of the Superheater which can be shut off from the Boiler ✓
Diameter of Safety Valve ✓ Pressure to which each is adjusted ✓ Is Easing Gear fitted ✓
IS A DONKEY BOILER FITTED? no If so, is a report now forwarded? ✓
SPARE GEAR. State the articles supplied:— See attached report.

The foregoing is a correct description,

For HARLAND & WOLFF Ltd

Manufacturer.

J. D. Reay

Dates of Survey while building
During progress of work in shops --
During erection on board vessel ---
Total No. of visits 151
Is the approved plan of main boiler forwarded herewith yes

Dates of Examination of principal parts—Casings 8-1-20 Rotors 8-1-20 Blading 2-6-20 Gearing 11-3-21
Rotor shaft 8-1-20 Thrust shaft 2-12-20 Tunnel shafts 2-12-20 Screw shaft 2-12-20 Propeller 30-11-20
Stern tube 30-11-20 Steam pipes tested 2-4-21 Engine and boiler seatings 2-1-21 Engines holding down bolts 9-6-22
Completion of pumping arrangements 6-3-23 Boilers fired 9-6-22 Engines tried under steam 22-3-23
Main boiler safety valves adjusted 8-3-23 Thickness of adjusting washers 5.4 1.2 3.4 5.6 7.8 9.10 11.12 13 14 15 16
Material and tensile strength of Rotor shaft Nickel Steel 19.37.6 + 36.2 19.36.6 + 36.1 Identification Mark on Do. 12556B, 12556C, 12556D, 12556E
Material and tensile strength of Pinion shaft Nickel Steel 19.44.8 + 45.5 19.45 + 45.9 Identification Mark on Do. 19.439 + 61.9 19.1109 + 111
Material of Wheel shafts Steel Identification Mark on Do. 246 + 247 Material of Thrust shafts Steel Identification Mark on Do. RJB 2-12-20
Material of Tunnel shafts Steel Identification Marks on Do. RJB 2-12-20 Material of Screw shafts Steel Identification Marks on Do. RJB 2-12-20
Material of Steam Pipes 80 Steel Test pressure 650 lbs
Is an installation fitted for burning oil fuel yes Is the flash point of the oil to be used over 150°F. yes
Have the requirements of Section 49 of the Rules been complied with yes
Is this machinery a duplicate of a previous case no If so, state name of vessel ✓

General Remarks (State quality of workmanship, opinions as to class, &c.)

The machinery of this vessel has been built under special survey and in accordance with the approved plans. Materials & workmanship good. Hydraulic tests satisfactory. The whole of the machinery is securely fitted & fixed in the vessel & has been tried under steam. It is in good & safe working condition & eligible in my opinion to be classed and have records **LMC 3-23**, Tail Shafts Continuous lines, Fitted for oil fuel. 3-23. F.P. above 150°F

The amount of Entry Fee ... £ 6-0-0 When applied for, Mar 23 1923
Special ... £ 133-1-6 When received, 1923
Electric Light ✓
Donkey Boiler Fee on 6.2 report ✓
Travelling Expenses (if any) £ ✓

William Butler

Engineer Surveyor to Lloyd's Register of Shipping.

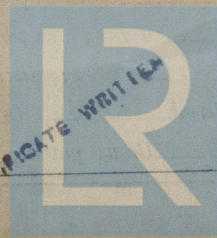
Committee's Minute

FRI 13 APR 1923

Assigned

+ Lmb 3.23 C.L.

Ltd for oil fuel 3.23
F.P. above 150°F.



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Belfast.

Spare Gear.

Y. S. S. Oroya

2. Propeller Blades with studs & nuts for one blade. One set coupling bolts for each size coupling. One escape valve spring of each size except for Main Turbines, & Check valves & 1/2 B safety valve springs, assorted bolts nuts & rivs.

Main Eng spare gear.

1 Escape valve spring of each size, & bolts nuts for each size of rotor bearing wheel bearing & pinion bearing; 10% of blading material, 5% total number of bolts & nuts for each gear case joint & turbine casing joint.

One set bearing bushes for one gear wheel shaft, 1/2 rotor, 1/2 rotor & for one pinion shaft

& set rotor shaft gland packing rings & springs. One set pads for one thrust block.

One set pads for adjusting block & one set liners for same.

& Thermometers for oil system.

Auxiliary engines.

One impeller, spindle & 1 set piston rings for each main circulating pp.

Main feed pumps:- one piston rod & one pump rod complete with piston & bucket

one set suction & delivery valves complete, one steam valve chest complete with spindle

Main Air pumps:- one pump rod & bucket complete with valves & nuts

one set valve & one foot valve complete with valves & guards, 1 steam valve chest with spindle one steam piston complete.

Forced lubrication oil pumps:- one complete set of suction & delivery valves for one pump & one pump rod & bucket.

one complete set of suction & delivery valves seats & guards for one pump of Ballast, Bilge, sanitary, fresh water, auxiliary & emergency, emergency bilge & general service pumps.

Gravitation filter:- one set of cages complete for one twin filter.

oil coolers. 10 Tubes.

oil fuel transfer pump. one piston rod & pump rod with nuts complete one steam piston & one oil piston with rings complete. one set suction & delivery group valves for one pump.

oil fuel pump. one piston & rod with nuts complete for steam & oil cylinders. one set suction & delivery valves group for one pump.

oil fuel burning:- 6 Burners, 12 Burner tips, 1/2 Burner springs, 1/2 Burner supply valves, 1/2 Burner supply pipes, 2 suction & 2 delivery filter baskets, 6 flame cutters, 6 jacket tubes & 2 Bar Cased thermometers.

Pumps.

Main feed pumps with automatic feed regulators (Weirs). $14\frac{1}{2} \times 12\frac{1}{2} \times 24$ "

Main air pumps (dual). $12\frac{1}{2} \times 22 \times 14$ " ; 1 aux feed pp (Weirs). $8\frac{1}{2} \times 6 \times 16$ "

1 Aux Air pp $12 \times 18 \times 10$; 1 Fresh water pp. $6 \times 6 \times 18$; 2 Bilge pps $9 \times 10 \times 21$

1 Ballast pp. $10\frac{1}{2} \times 12 \times 21$; 1 aux centrifugal Air pp. 6×8 disch. 32 " imp

2 Main centrifugal pps. $12\frac{1}{2} \times 10 \times 51$ " dia imp; 1 General Service

pp. $12 \times 8 \times 18$; 2 Sanitary pps. $9 \times 9 \times 18$; 1 Emergency bilge transfer driven 10×18 "

emergency feed pp. $8\frac{1}{2} \times 6 \times 18$; 2 oil fuel transfer pps. $8 \times 9 \times 16$ "

2 oil fuel delivery pps. (Weir) $6\frac{1}{2} \times 4\frac{1}{2} \times 10$ "

2 Forced lubrication pps. (Main imp). (Weirs) $8 \times 9 \times 15$ "

William Dalrymple

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